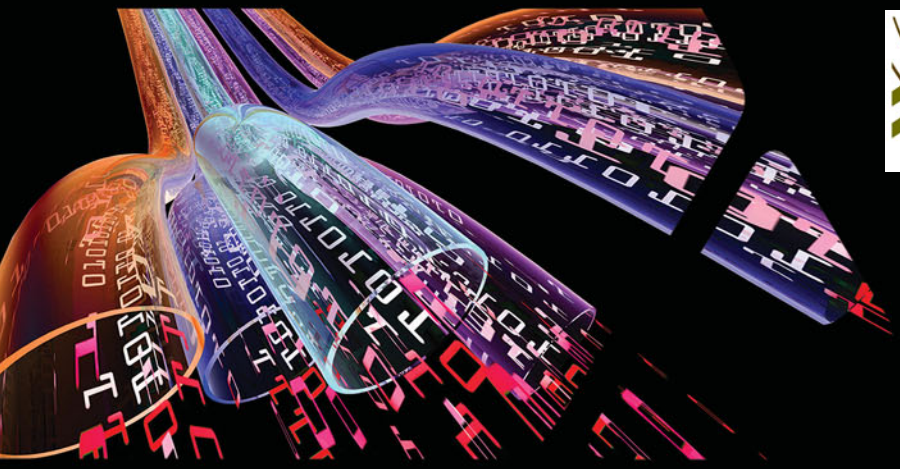


RAVENNA ASIO & Core Audio Guide

For Merging Technologies Horus

MERGING

No part of this documentation may be reproduced in any form whatsoever or be stored in any data retrieval system without prior written permission of the copyright owners.

This documentation is supplied on an as-is basis. Information contained within this documentation is subject to change at any time without notice and must not be relied upon.

All company and product names are ™ or Registered Trademarks ® of their respective owners. Windows 7 is a trademark of Microsoft Corporation. Lion, Core Audio and Bonjour, the Bonjour logo, and the Bonjour symbol are trademarks of Apple Computer, Inc. RAVENNA is a registered trademark of ALC NetworX GmbH and is used here under licence.

Merging Technologies makes no warranties express or implied regarding this software, its quality, performance, merchantability or fitness for a particular purpose. The software is supplied “as is” you, the purchaser, are assuming the entire risk of the results of using this Merging Technologies software.

In no circumstances will Merging Technologies, its owners, directors, officers, employees or agents be liable to you for any consequential, incidental or indirect loss or damages including loss of time, loss of business, loss of profits, loss of data or similar resulting from the use of or inability to use the Merging Technologies hardware and or software or for any defect in the hardware software or documentation.

Product features and specifications are subject to change without notice.

© Copyright Merging Technologies Inc. 2013. All rights reserved

Ravenna ASIO & Core Audio Guide

For Merging Technologies Horus

Contents

1 Introduction 5
- Scope 5

2 Introduction to Ravenna Technology 6

3 Merging Ravenna ASIO Driver (PC) 9
- ASIO 9
- System Requirements 9
- Installing the Ravenna ASIO Driver 10
- Bundled Applications and Documentation 13
- Troubleshooting 14

4 Merging Ravenna Core Audio Driver (Mac) 17
- Core Audio 17
- System Requirements 17
- Installing the Ravenna Core Audio Driver 18
- Bundled Applications and Documentation 21
- Troubleshooting 22

5 Horus Preamp Remote Control 23
- Pro Tools on Mac 23
- Pro Tools on PC 26

6 Pyramix 27

7 General Troubleshooting 28

8 MT Discovery 29
- Overview 29
- Using MT Discovery 30
- Additional Information 31

9 Merging Ravenna Easy Connect 32
- Overview 32
- Accessing Easy Connect 32
- Additional Details 36

10 Contacting Merging 38
- International Office: 38
- UK: 38
- USA: 38

11 Index 39

Ravenna ASIO & Core Audio

For Merging Technologies Horus

Document: RAVENNA ASIO & Core Audio rev9

Date: 20th July 2013

1 Introduction

Ravenna is a solution for real-time distribution of audio and other media content in IP-based network environments. It was designed primarily by a company called ALC NetworX. Ravenna utilizes standardized network protocols and technologies and can operate in existing network infrastructures. Performance and capacity scale with the capabilities of the underlying network architecture.

For more information about Ravenna technology **please see: Introduction to Ravenna Technology on page 6** and:

http://ravenna.alcnetworx.com/

Scope

This document is intended to get you up and running Ravenna in ASIO/CoreAudio with your Merging Technologies Horus converter on your PC Windows system or MAC OSx system. For more detailed information about the **Horus** and **Pyramix** and **Ovation** software please see their specific Guides.

2 Introduction to Ravenna Technology

Scope

The information in this chapter is provided as background of the philosophy and technology behind Ravenna.

Overview

Ravenna is a technology for real-time distribution of audio and other media content in IP-based network environments. Utilizing standardized network protocols and technologies, Ravenna can operate on existing network infrastructures. Ravenna is designed to meet the strict requirements of the pro audio market featuring low latency, full signal transparency and high reliability.

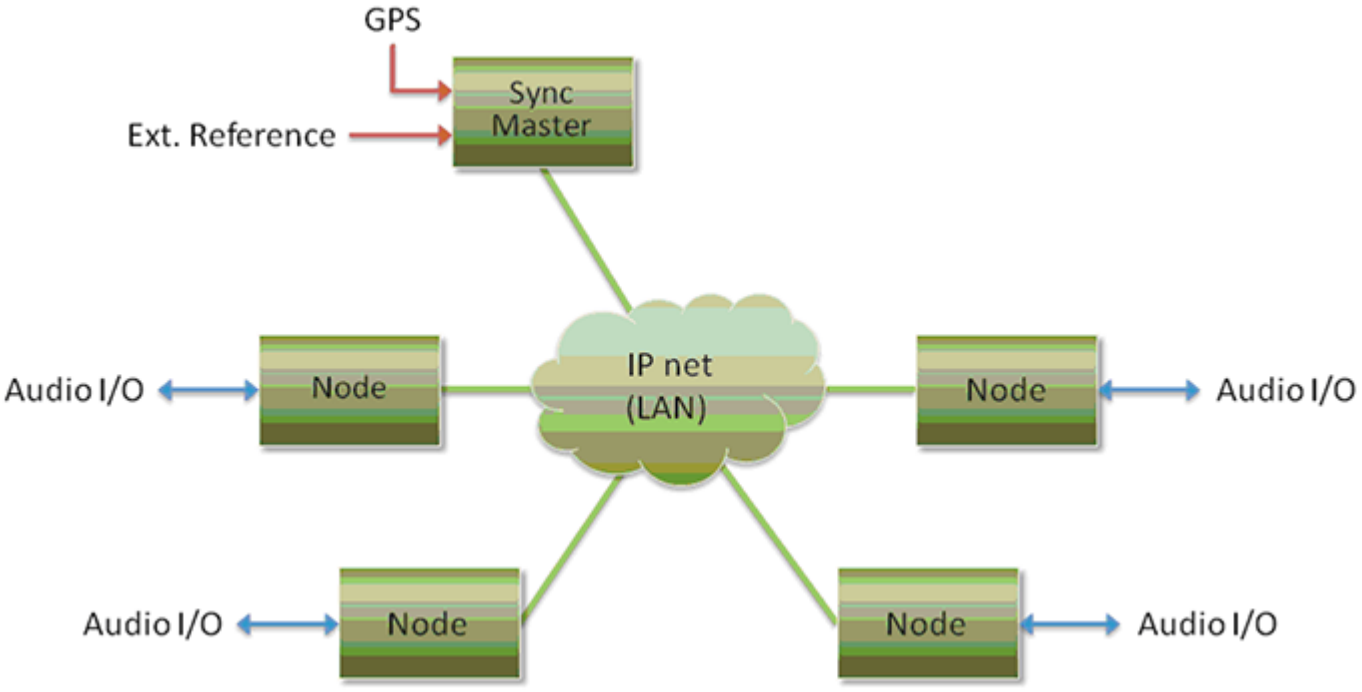
Ravenna is suitable for deployment in many pro audio market segments including broadcast, live sound, studios the install market and location music recording. Possible fields of application include (but are not limited to) in-house signal distribution in broadcasting houses, theaters, concert halls and other fixed installations, flexible set-ups at venues and live events, OB van support, interfacility links across WAN connections and in production & recording applications.

In short, it represents a new take on the third generation form of audio interconnect, where the first generation of interconnect is analogue point-to point copper, the second generation uses digital codes representing the analogue signal, conveyed point to point over copper or fibre-optic cabling and the third generation also employs digital codes representing the analogue audio but transported as packets over network infrastructure.

Ravenna is very well suited to areas where complex audio routing / mixing systems are deployed. For example; in-house distribution in broadcasting centres and WAN connections to satellite studios, OB vans, where hook up to venues with the same infra-structure becomes simple, in venues themselves for local signal distribution and connection to just such OB vehicles when required. For live events and concerts it offers highly flexible temporary installation possibilities and in theatres, opera houses and houses of worship it can provide low cost local signal distribution. Notwithstanding all of the above, Ravenna is also an excellent candidate for relatively simple point to point interconnects such as computer to audio interface.

However, Ravenna, leaving aside the other advantages touted, is an open standard based on the ubiquitous IP protocol. Specifically, protocol levels on or above layer 3 of the OSI reference model. Since Ravenna is purely based on layer 3 protocols, it can operate in most existing network environments. Unlike layer 1 or layer 2 solutions, it does not, in principle, require its own network infrastructure. IP can be therefore be transported on virtually any LAN and is used as the base layer for communication across WAN connections (including the internet). Although in most cases Ethernet will be deployed as the underlying data link layer, IP is in general infrastructure-agnostic and can be used on virtually any network technology and topology. All the protocols and mechanisms used in Ravenna are based on well established and commonly used methods from the IT and audio industries and comply with various standards defined and maintained by the international standards bodies.

Basic Components



Ravenna Network Basic Components Example

A Ravenna system requires a carefully configured IP network, a master clock device and any number of Ravenna enabled I/O nodes. The master clock can be either a dedicated device or any Ravenna node capable of serving as a grandmaster. The preferred time domain reference is GPS. Simple streaming across a network can be achieved without any synchronization at all but in pro audio applications tight synchronization between all devices and streams is absolutely mandatory. While playback synchronization in most applications requires sample accuracy, one goal for Ravenna is to provide superior performance by offering phase-accurate synchronization as an option thus rendering separate reference word clock distribution throughout a facility or venue redundant.

Flexibility

The system design approach allows for operation with or without centralized services for configuration / connection management. ALC NetworX recommends that basic device configuration (e.g. initial settings and setup of audio streams) should be executed via a web interface (http). However other methods may be used in addition or as an alternative.

Device discovery is accomplished with DNS-SD (via an mDNS or DNS service). In small networks, without DHCP / DNS servers, the zeroconf mechanism - a fully automatic, self-configuring method - is used for auto-IP assignment and service advertisement & discovery.

Streams available on the network are represented by SDP records with extended information (i.e. a clock domain identifier, RTP time stamp association etc.) Clients can connect to streams via RTSP or SDP/http.

Resilience

As you would expect Ravenna supports redundancy. Although modern network infrastructures can be configured to guarantee a high level of transport security and reliable 24/7 operation for added security there is the option of full network redundancy. Each Ravenna device can include two independent network interfaces which can be connected to independent physical networks. By duplicating any outgoing stream to both network links, any destination device will receive the full stream data on both network interfaces independently. If data from one link is corrupted, or one network link fails completely, the uncorrupted data is still present on the other link. Changeover in the event of the failure of a network link is automatic.

Streaming

Unicast

Unicast (one-to-one) is used in application scenarios such as an individual stream between two devices (e.g. a multi-channel stream between a console and a recorder/DAW). This uses a point-to-point connection between the sender and receiver. Since each additional receiver adds its own individual connection network traffic increases with every additional unicast stream.

Multicast

Multicast (one-to-many) streaming is used in scenarios where a single source is to be distributed to many potential recipients (e.g. program stream to journalists' desktops). At the sending end this only requires one connection per stream. Network switches are aware which participants (receivers) should receive any particular multicast and forward packets only to registered nodes. In multicast set-ups the network traffic only increases on the last (closest to receiver node) segment(s) of the network path.

Infrastructure

The network infrastructure must be able to transport IP packets and must support a number of standard operating protocols, e.g. RTP/RTPC for streaming since this is used widely and supports a wide variety of standard payload formats. Some of these formats are mandatory for all Ravenna devices, others are optional. For example this protocol offers the possibility of standard media player applications subscribing to Ravenna streams. Synchronization across all nodes is achieved via the IEEE1588-2008 (PTPv2 Precision Time Protocol). This is another standard protocol which can be used on IP. PTPv2 provides a means for synchronizing local clocks to a precision as defined in AES-11. Accurate synchronization can even be achieved across WAN connections when GPS is used as a common time domain.

Quality of Service

For the QoS (Quality of Service) protocol DiffServ has been chosen since it is widely supported by most modern managed switches. Since other traffic can co-exist with Ravenna on the same network, Ravenna traffic must be on the fast track. Ravenna packets are assigned a high priority classification to ensure expedited transport across the network, while other packets with lower priority are treated as best-effort traffic. Even within Ravenna there are different priorities assigned to different classes of traffic. Synchronization is assigned the highest priority, immediately followed by any real-time media traffic, while control and configuration traffic will be on a lower priority level. Any non-Ravenna traffic would receive the lowest (standard) priority and be treated as best-effort traffic. Performance and capacity scale with the capabilities of the underlying network architecture.

3 Merging Ravenna ASIO Driver (PC)

Overview

The Ravenna ASIO Driver is intended for owners of Horus hardware using Windows 7 and who wish to work in ASIO Ravenna mode.

ASIO

Steinberg's Audio Stream Input/Output (ASIO) provides audio stream connectivity between software applications and audio hardware on Windows.

System Requirements

Wintel platforms tend to increase in number of cores, speed and performance at a tremendous rate. New and faster processors are released almost on a monthly basis.

We maintain a list of up to date PC configurations in the Support Section of our website at:

http://www.merging.com/pages/pcconfig

Refer to the Merging Ravenna recommendations (Minimum CPU requirement - QuadCore)

Certified PC Operating Systems (OS)

We recommend installing the ASIO driver under Windows 7 Professional 32 bit or 64 bit.

> **Note:** Although not certified, it has also been observed to work under the Home editions of Windows 7 (32-bit). The ASIO driver is NOT supported under XP or Vista.

Warning: NEVER attempt to install the Driver on Windows NT Server

The ASIO Driver has been tested and qualified on Windows 7 Professional 32 bit and 64 bit

Notes

- Available as of the release of Pyramix v8
- The Ravenna ASIO driver supports up to 4fs (192kHz)
- Windows 7 - 32bit & 64bit (make sure that you download the correct installer)
- The ASIO Driver is not multi-client. I.e. it cannot be used with multiple applications at the same time. Only one application at a time can use the ASIO Driver on the same system.
- A separate sound card for other general work is recommended.

Numbers of inputs and outputs available

- 1fs (44.1kHz / 48kHz) = 64 I/O
- 2fs (88.2 kHz / 96kHz) = 32 I/O
- 4fs (176.4 kHz / 192 kHz) = 16 I/O
- 8fs (352.8 kHz / 384 kHz = 8 I/O

Tips

- Ensure the ASIO/CoreAudio clock is activated (set to Auto) under the Horus menu **setup > advanced**
- Sampling rate setting changes must be done on the Horus.
- The ASIO host will follow the Horus sampling rate changes
- Disable your Antivirus and your Windows Public Firewall

Note: The MassCore PCIe Ethernet card NET-MSC-GBEX1 cannot be used with the Ravenna ASIO driver since it is specific to MassCore. For Native use on PCs with PCI-e slots the Merging Technologies NET-INT-GBEX1 card is available. (Please contact your Merging Technologies Sales Partner for details.)

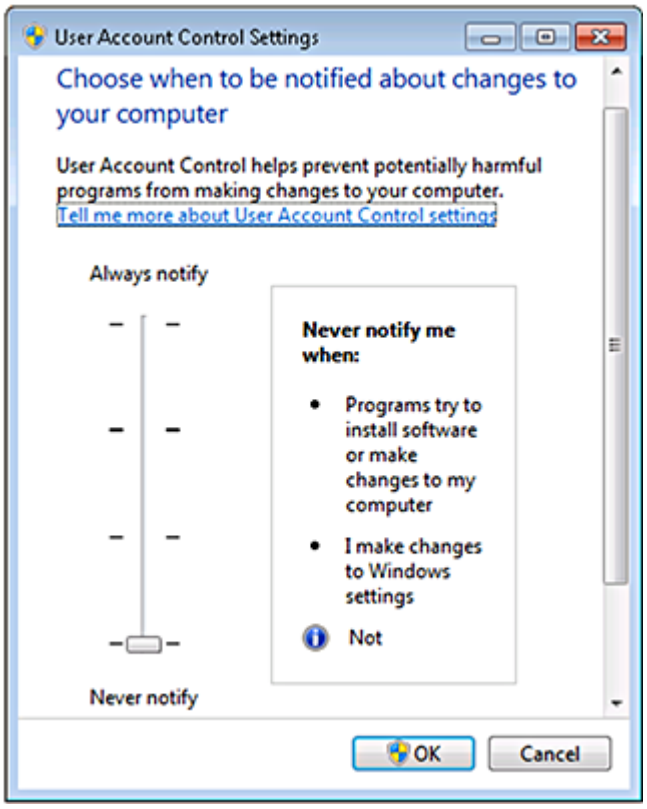
Installing the Ravenna ASIO Driver

Prerequisites

The Merging Ravenna ASIO Driver can be installed on PC systems which do not have Pyramix installed, but at least one Horus is required before the Driver will function if other Ravenna devices are present.

Installation Procedure

1. Disable Windows UAC. (User Account Control) Set it to **Never Notify** and restart the PC.


User Account Control Settings
Choose when to be notified about changes to your computer
User Account Control helps prevent potentially harmful programs from making changes to your computer.
Tell me more about User Account Control settings
Always notify
Never notify me when:
Programs try to install software or make changes to my computer
I make changes to Windows settings
Not
Never notify
OK
Cancel

Windows User Account Control Settings

Note: We also recommend disabling the Windows Firewall and any Antivirus software when working in Ravenna.

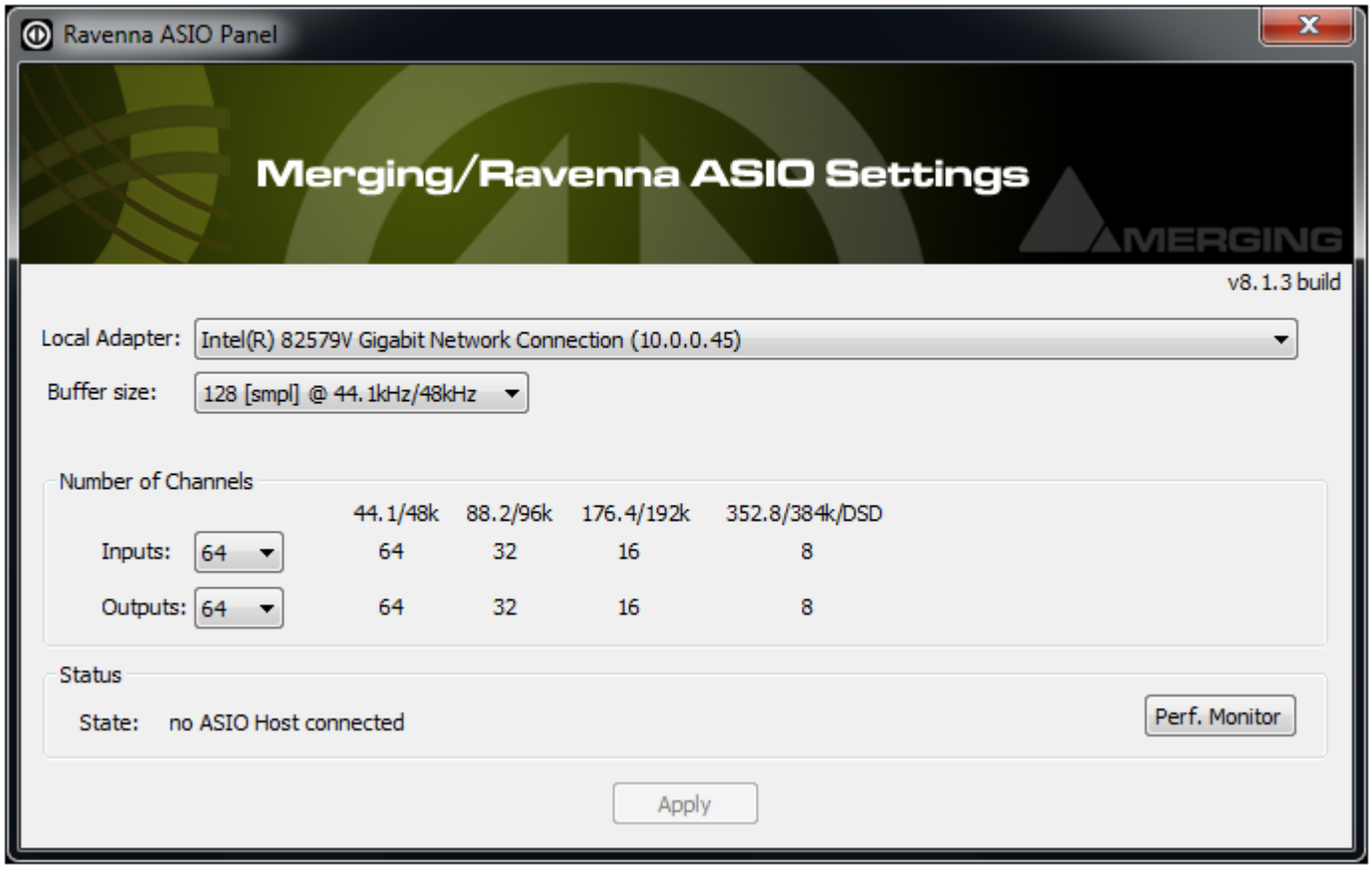
2. Download the latest Merging Ravenna ASIO Driver from:

   http://www.merging.com/horus/download

3. Be aware that separate 32bit and 64 bit versions are available and certified under Windows 7 only.
   Verify your current OS configuration and then download and install the appropriate Ravenna ASIO driver version.

   Note: The installer may warn of pending requirements (Bonjour & Microsoft Redistributable C++ 2008 SP1.) Accept and proceed with these installations.

4. When installation is complete accept the software licence agreement
5. Restart the computer.
6. When the PC has rebooted open the Ravenna ASIO Panel.
   Windows Start Menu - All Programs > Merging Technologies > Ravenna ASIO



RAVENNA ASIO Panel

7. Configure Merging Ravenna ASIO Settings:

   - **Local Adapter:** - lists all available network ports. Select the network port the Horus is connected to.
   - **Buffer size:** - Buffer sizes available are: 512 - 256 - 128 - 64 [smpl]. Based on 1fs (44.1kHz/48kHz) A buffer size of 256 samples is recommended.
   - **Number of Channels**

     Inputs:

     Outputs:

     Maximum of 64 Inputs and Outputs @1fs

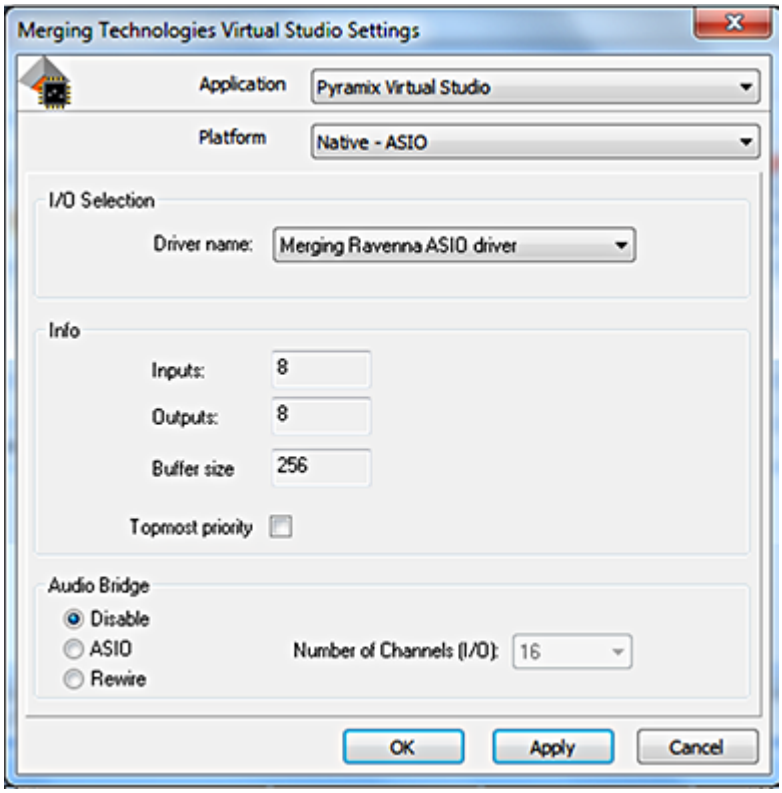
     Maximum of 32 Inputs and Outputs @2fs

     Maximum of 16 Inputs and Outputs @4fs

     Maximum of 8 Inputs and Outputs @8fs

- **Status - State:** Shows the connected ASIO Host or **no ASIO Host connected**
- **Monitoring:** - Opens up a panel used for debugging

8. Configure the application you wish to use (Pyramix or other DAW) so that the I/O connections use the Merging Ravenna ASIO Driver
9. For Pyramix users the VS3 Control Panel must first be opened and the **Merging Ravenna ASIO driver** selected under **I/O Selection -Driver name:** .



VS3 Control Panel

10. Ensure that the Horus is connected to correct Gigabit Ethernet port and launch the DAW application.

Note: VS3 Control Panel Error. If you encounter an error such as: **NIC Adapter not present** ensure that the Horus is NOT connected to the MassCore NET-MSC-GBEX1 Ethernet interface card. (Not supported for Ravenna ASIO.) The Horus should be connected to the system gigabit Ethernet port selected in the **Ravenna ASIO Control Panel**. Also ensure that the VS3 Control Panel os configured to use ASIO.

Bundled Applications and Documentation

Additional applications and documentation are installed with the Merging Ravenna ASIO drivers.

Look in the Windows Start menu - All Programs > Merging Technologies > to find the entries below:

> Documentation

The folder contains documentation on all applications and utilities.

> MTDiscovery

MT Discovery is a standalone application that searches your network for Bonjour Services. It allows quick and easy access to Merging's Web Services based on Bonjour, such as the Horus configuration page. These pages will open in your computer's default browser.

Users can also use MT Discovery for Horus remote access and in order to update their Horus Firmware. **Please see: MT Discovery on page 29**

> Ravenna Easy Connect

The Merging Ravenna Easy Connect utility is included in the ASIO and Core Audio Drivers package. This utility enables Horus users to connect the Ravenna visible streams and route the desired I/Os. **Please see: Merging Ravenna Easy Connect on page 32**

> Merging Ravenna ASIO Driver panel

This will open the **Ravenna ASIO Driver Settings** for configuration

> **Note:** The custom installation of the Ravenna ASIO drivers allows for the MTDiscovery and Ravenna Easy Connect applications to be omitted from the installation.

Troubleshooting

Ravenna ASIO Panel

Please close the DAW application before making changes. Restart the DAW after accepting the changes.

> **Note:** Sampling Rate changes must be made on the Horus. The DAW will follow the Horus sampling rate.

Buffer size recommendations

Merging recommends setting the buffer size to 256 samples.

Latency and clicks

Audible pops and clicks can occur when using some third-party audio interfaces or depending on the speed of the processor. To avoid this problem increase the Hardware Buffer size for the device. You should aim for the lowest possible I/O buffer size value that doesn't introduce clicks, pops, and crackles in the audio.

Ravenna ASIO Latencies

Ravenna ASIO latencies			
Sampling Rate	**Buffer Size**	**Recommended**	**Not Recommended**
44.1 kHz	64 smpl		√*
	128 smpl	√	
	256 smpl	√	
	512 smpl	√	
	1024 smpl		√
48 kHz	64 smpl		√*
	128 smpl	√	
	256 smpl	√	
	512 smpl	√	
	1024 smpl		√
88.2 kHz	64 smpl		√*
	128 smpl	√	
	256 smpl	√	
	512 smpl		√*
	1024 smpl		√*
96 kHz	64 smpl		√*
	128 smpl	√	
	256 smpl	√	
	512 smpl		√*
	1024 smpl		√*
176.4 kHz	64 smpl	√	
	128 smpl	√	
	256 smpl		√*
	512 smpl		√*
	1024 smpl		√*
192 kHz	64 smpl	√	
	128 smpl	√	
	256 smpl		√*
	512 smpl		√*
	1024 smpl		√*
DXD(352.8/384kHz) & DSD	64 smpl	√	
	128 smpl	√	
	256 smpl		√*
	512 smpl		√*
	1024 smpl		√*
* Potential noise or clicks			

No Playback, no I/Os

There is a potential problem when changing sampling rate. (DAW cursor locked or mismatched sampling rate) In such a case ensure the DAW (Pyramix) is exited first then change the sampling rate on the Ravenna ASIO panel before re-launching the DAW. (Pyramix) Now check that the Project sampling rate and Horus sampling rate match the Ravenna ASIO panel sampling rate. Re-start if necessary.

On the Horus make sure that the ASIO/CoreAudio Clock is enabled (**auto**) under the Horus page: **SetUp > Advanced**

If the problem persists then force a **Clear all Connections** in **Easy Connect** (**Ctrl + Click** on **Clear All Connections**), restart the PC and Horus and make the connections again.

Firewall and Antivirus

Windows Firewall

The Windows Firewall can block communication between MassCore and Horus. As mentioned in the install procedure we recommend disabling the Public Network Firewall

Procedure

1. Go to **Windows Control Panel > Windows Firewall**.
2. Click on **Turn Windows Firewall on or off**
3. Go to the **Public Network** section and select **Turn Off Windows Firewall**

Antivirus

Merging also recommends disabling their Antivirus, as mentioned in the install procedure. Some Antivirus software such as Avast have been known to block the Horus discovery and Ravenna I/O Connections.

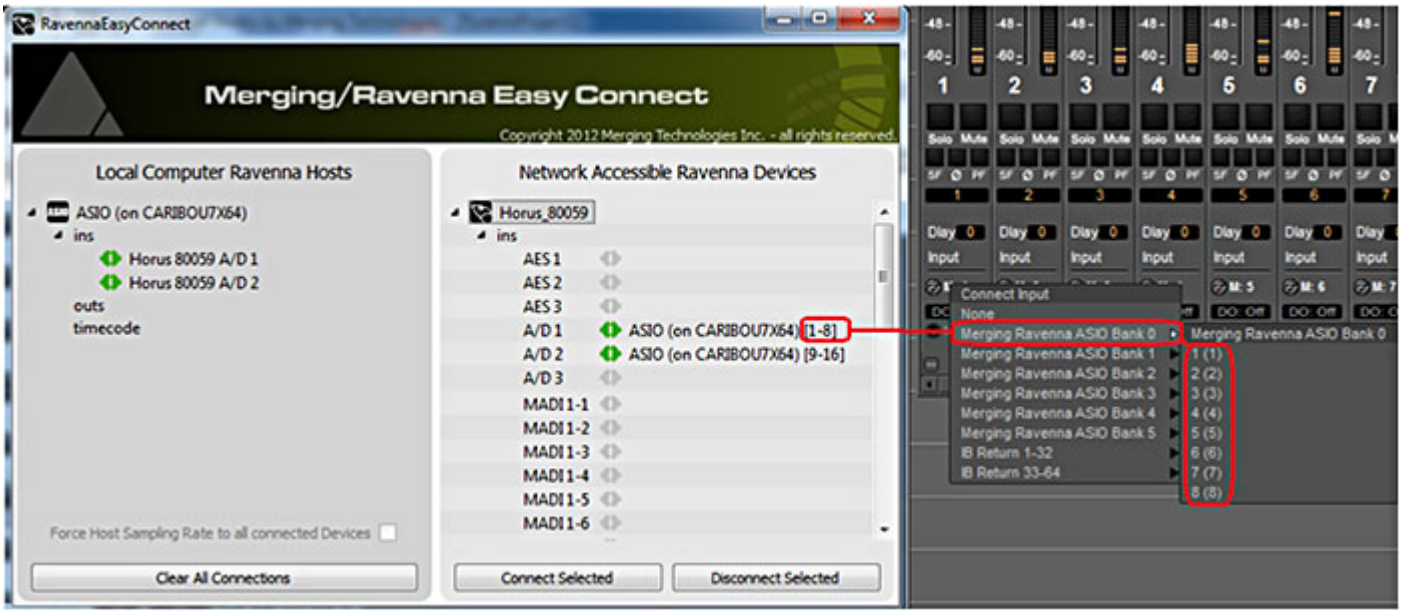
Ravenna ASIO Driver Error When Launching VS3 Control Panel

If you have an error such as **unable to bind to the network interface** check that Windows UAC (User Account Control) was disabled, as mentioned in the install procedure. Set it to **Never Notify** and restart the PC.

I/O Connection Naming & Channel Count

When using the Ravenna ASIO driver the connections enabled in **Easy Connect** do not display the module name or connection count in the Pyramix Mixer.

For example: If the Ravenna ASIO Panel has 48 I/Os selected a fixed count of 48 I/O channels (at 1fs) will appear in the Pyramix Mixer. The module naming will be generic. It is necessary to refer to the Easy Connect connections numbering in order to identify the I/O routing.



RavennaEasyConnect and Pyramix Routing

4 Merging Ravenna Core Audio Driver (Mac)

Overview

The Ravenna ASIO Driver is intended for owners of Horus hardware using Mac OS X Lion and who wish to work in Core Audio Ravenna mode.

Core Audio

Apple's Core Audio is a standardized audio driver system for all Macintosh computers running Mac OS X version 10.2 or later. Core Audio is an integral part of Mac OS X, allowing access to all Core Audio compatible audio interfaces.

System Requirements

We recommend installing the Core Audio driver under Lion OS X

Certified MAC Operating Systems (OS)

The CoreAudio Driver was tested and qualified on Mac OS X Lion v10.7

Notes

- The Ravenna Core Audio driver supports up to 4fs (192kHz)

Numbers of inputs and outputs available

- 1fs (44.1kHz / 48kHz) = 64 I/O
- 2fs (88.2 kHz / 96kHz) = 32 I/O
- 4fs (176.4 kHz / 192 kHz) = 16 I/O

Tips

- Ensure the ASIO/CoreAudio clock is activated (set to Auto) under the Horus menu **setup > advanced**
- The DAW application must be quit before making changes in the Ravenna Core Audio Control Panel.

Installing the Ravenna Core Audio Driver

Prerequisites

The Merging Ravenna Core Audio Driver can be installed as a stand-alone driver on systems which do not have Pyramix installed, but at least one Horus is required before the Driver will function if other Ravenna devices are present.

Installation Procedure

1. Download the Ravenna Core Audio Installer for MAC.

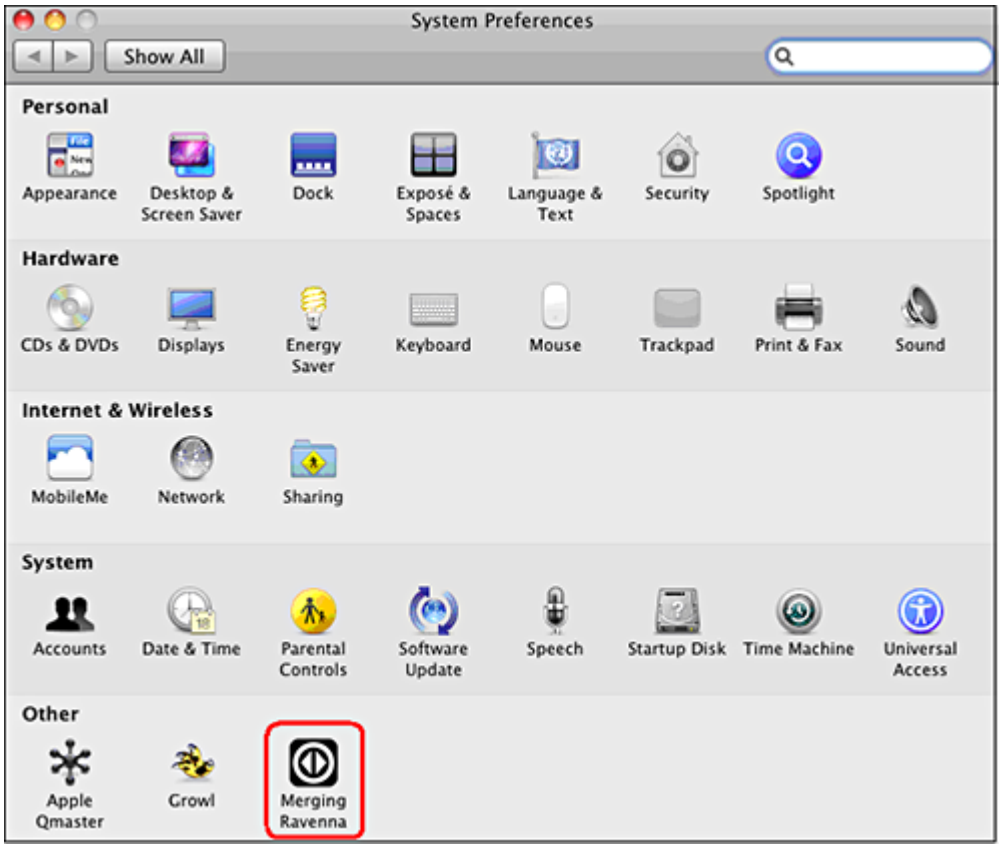
   http://www.merging.com/horus/download

2. Open the **Merging Ravenna Core Audio Installer .dmg** file.
3. Click on **Continue** to proceed with the installation.

Install dialog

4. Follow the installer instructions. You will be prompted to enter the Administrator password
5. When the install is complete it will display **Successful**. Click **Close** to exit.
6. Restart the MAC after the driver installation is completed.

7. Go into **MAC System Preferences**, in **Other** open the **Merging Ravenna** icon.



System Preferences

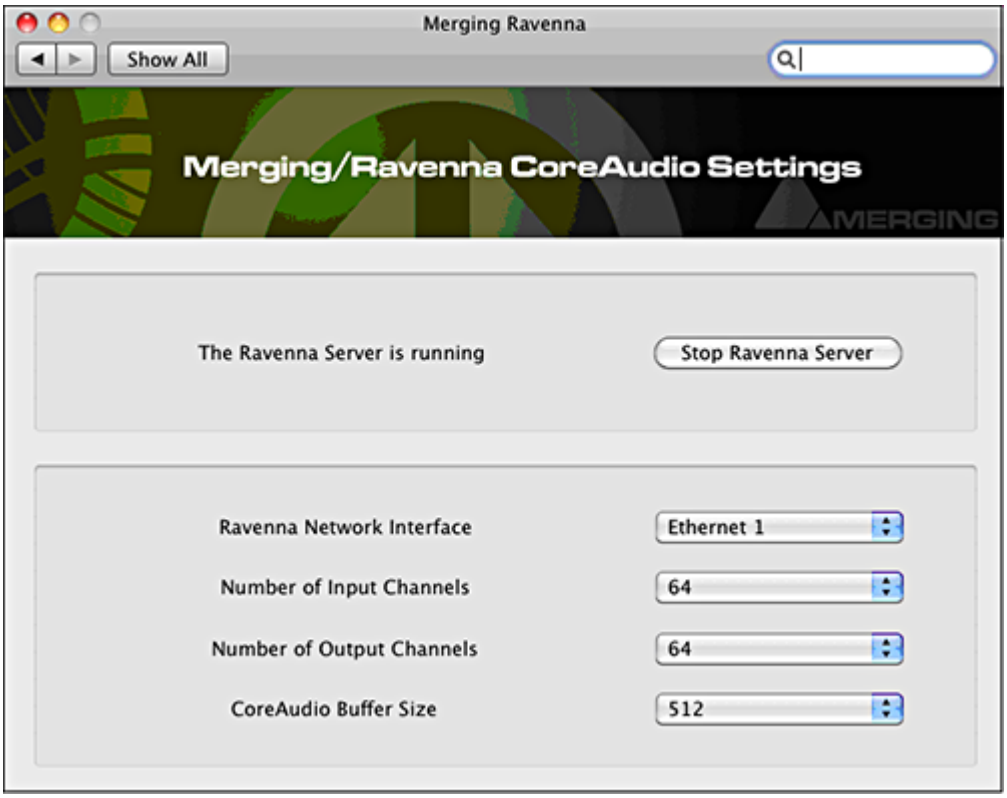
8. Configure Merging Ravenna ASIO Settings:
   - **Local Adapter:** - lists all available network ports. Select the network port the Horus is connected to.
   - **Buffer size:** - Buffer sizes available are: 512 - 256 - 128 - 64 [smpl]. Based on 1fs (44.1kHz/48kHz) A buffer size of 256 samples is recommended.
   - **Number of Channels**

     Inputs:

     Outputs:

     Maximum of 64 @1fs
   - **Status - State:** Shows the connected ASIO Host or **no ASIO Host connected**
   - **Monitoring:** - Opens up a panel used for debugging
9. Configure the application you wish to use (Pyramix or other DAW) so that the I/O connections use the Merging Ravenna ASIO Driver

10. Configure the Ravenna Core Audio Settings Panel



Merging/Ravenna Core Audio Settings Panel

11. Check that he Ravenna Server is running

12. **Ravenna Network Interface** lists all available network ports. Chose the network port where the Horus or Ravenna Device is connected to.

13. **Number of Input Channels** available is limited to 64

14. **Number of Output Channels** available is limited to 64

15. **Core Audio Buffer Size** Buffer sizes available are: 1024 - 512 - 256 - 128 - 64 [smpl]. Based on 1fs (44.1kHz/48kHz) A buffer size of 256 samples is recommended.

16. The buffer sizes available are: 1024 - 512 - 256 - 128 - 64 [smpl] (Based @ 1fs (44.1kHz/48kHz))

Bundled Applications and Documentation

Additional applications and documentations are installed along with the Ravenna Core Audio installer. Look under **Places** to find all the necessary tools and information in order to work in Ravenna mode.

MTDiscovery

MT Discovery is a standalone application that searches your network for Bonjour Services. It allows quick and easy access to Merging's Web Services based on Bonjour, such as the Horus configuration page. These pages will open in your computer's default browser.

Users can also use MT Discovery for Horus remote access and in order to update their Horus Firmware. **Please see: MT Discovery on page 29**

Ravenna Easy Connect

The Merging Ravenna Easy Connect utility is included in the ASIO and Core Audio Drivers package. This utility enables Horus users to connect the Ravenna visible streams and route the desired I/Os. **Please see: Merging Ravenna Easy Connect on page 32**

Uninstaller

Use the uninstaller to remove the Merging Ravenna Core Audio driver installation cleanly.

Documentation

Here you will find relevant documentation on all applications and utilities.

Troubleshooting

Ravenna Core Audio Panel

Please close the DAW application before making changes. Restart the DAW after accepting the changes.

> **Note:** Sampling Rate changes must be made on the Horus. The DAW will follow the Horus sampling rate.

Ravenna Server

For the driver to function properly check that the Ravenna Server is running in the Ravenna Core Audio panel. If not running, start it.

Buffer Size Recommendations

A buffer size of 256 samples is recommended.

Latency and Clicks

Audible pops and clicks can occur when using some third-party audio interfaces or depending on the speed of the processor. To avoid this problem increase the Hardware Buffer size for the device. You should aim for the lowest possible I/O buffer size value that doesn't introduce clicks, pops, and crackles in the audio.

Security Firewall

The Mac Firewall can block communication between Ravenna and Horus.

Mac Security panel - Firewall Tab

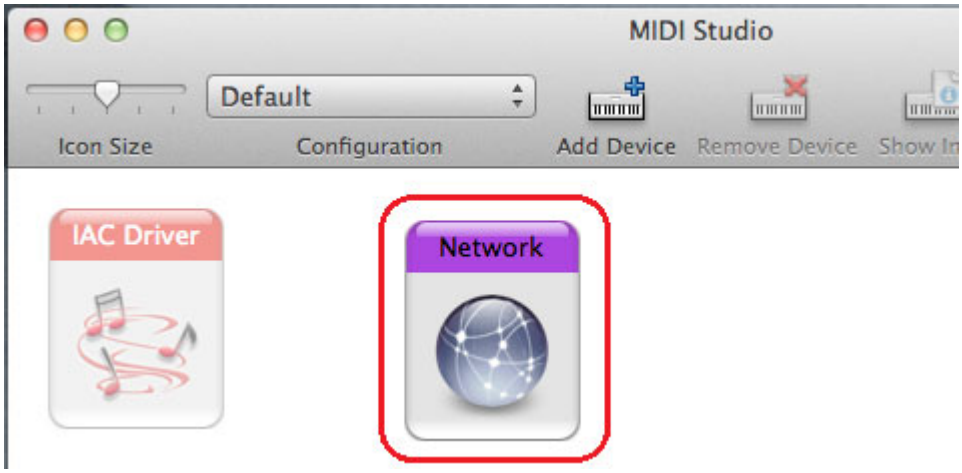
Recommendation: Disable by switching it **Off**.

5 Horus Preamp Remote Control

Pro Tools on Mac

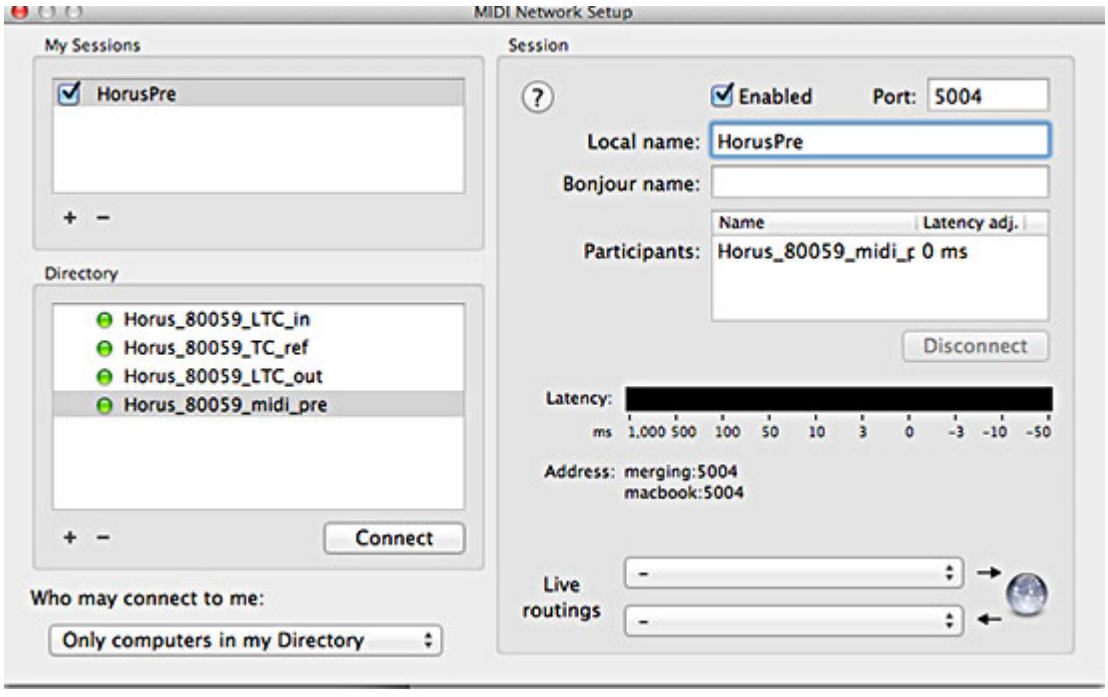
Horus analog preamps can be controlled directly from within Avid Pro Tools running on a Mac.
In order to set Pro Tools up for Horus preamp control follow this procedure:

1. Check the Horus firmware version and update if necessary to **v19734** or above.
2. Connect Horus to the system running Pro Tools through the Ethernet. port.
3. Open Mac MIDI Studio.



Mac MIDI Studio Panel

4. Select **Network** to open the **MIDI Network Setup**:

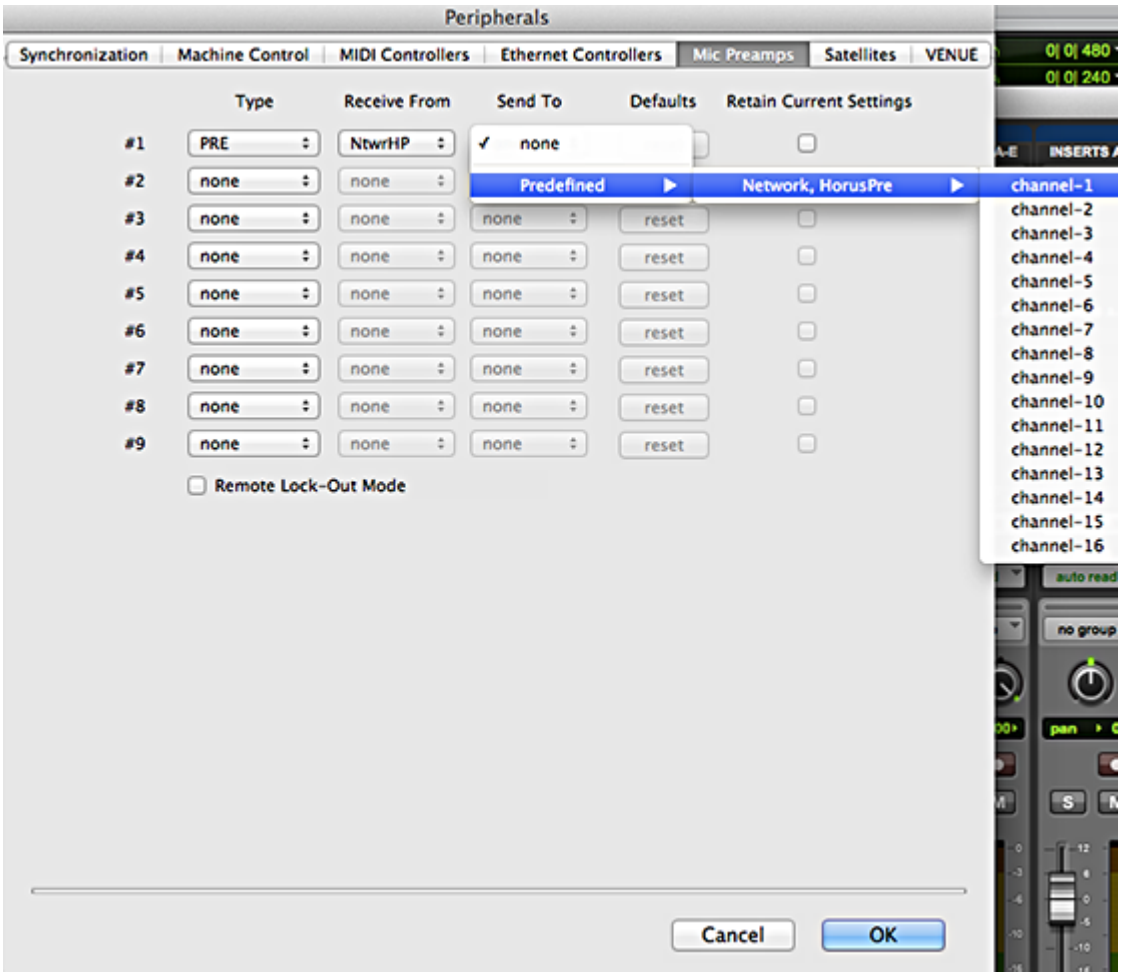


MIDI Network Setup Panel

5. In the **My Sessions** section (top left) click on the **+** sign to add a new entry.
6. In the **Session** section (right) rename the entry in the **Local name:** field to **HorusPre**.
7. In the **Directory** section (bottom left) select the **Horus_80xxx_midi_pre** module entry to add it to the **Participants** list.
8. At the top of the **Session** section check the **Enabled** box to enable the session.
9. Close the **MIDI Network Setup** panel.

Within Pro Tools:

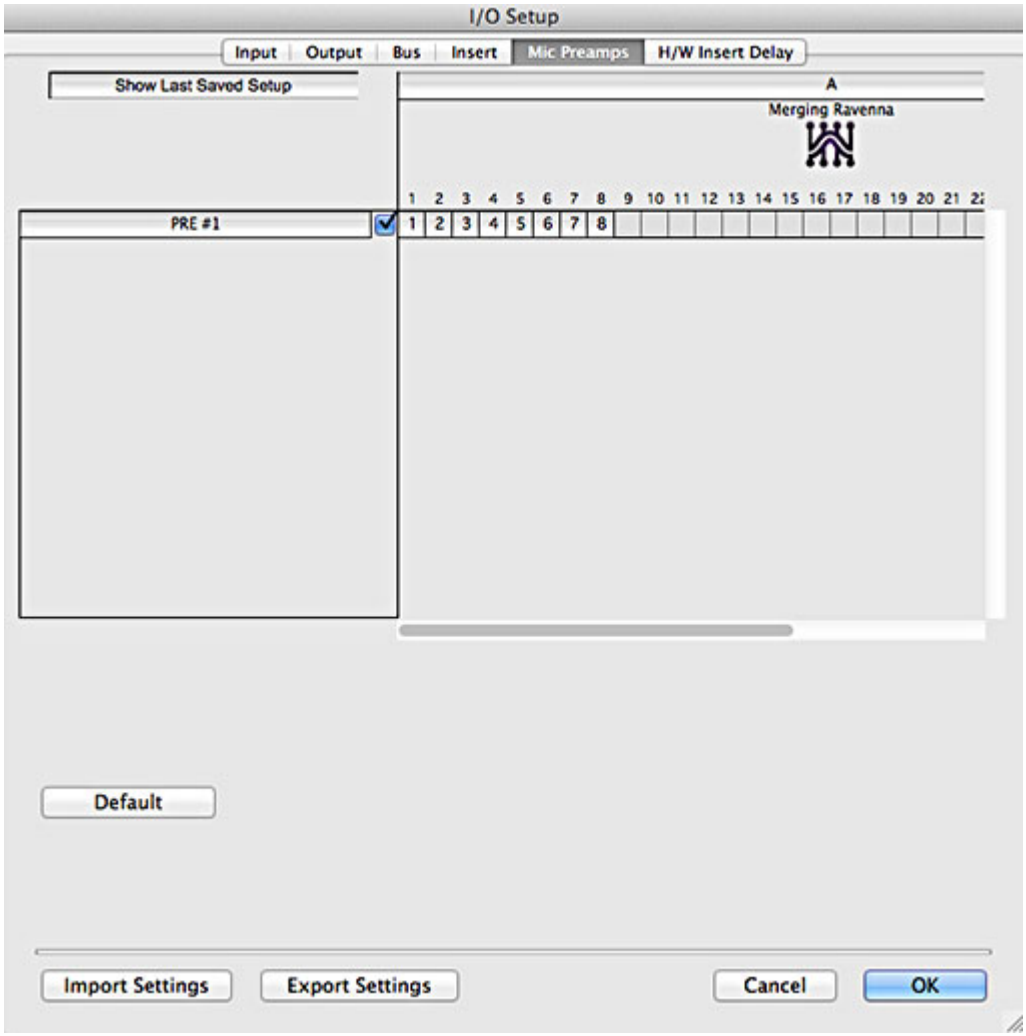
10. Launch **Pro Tools** and configure to work with **Ravenna Core Audio** I/O.
11. Open **Pro Tools Peripherals Settings**.



Pro Tools peripherals Settings Mic Preamps tab

12. In the Peripherals panel select the **Mic Preamps** tab and select in order: **Pre**, **NtwrHP** and **Send to predefined>network**, **HorusPre>Channel-1**
13. Click on **OK** and close the **Peripherals** panel.

14. Open the **pro Tools I/O Setup** panel.



Pro Tools I/O Setup panel Mic Preamps tab

15. In the **Mic Preamps** tab enable the **Horus PRE #1** by checking the box to the right of the entry.

16. Click on **OK** and close the **I/O Setup** panel.

The Horus preamp controls will be available within Pro Tools when the Horus Preamps are connected to the Pro Tools Mixer Strip Inputs.

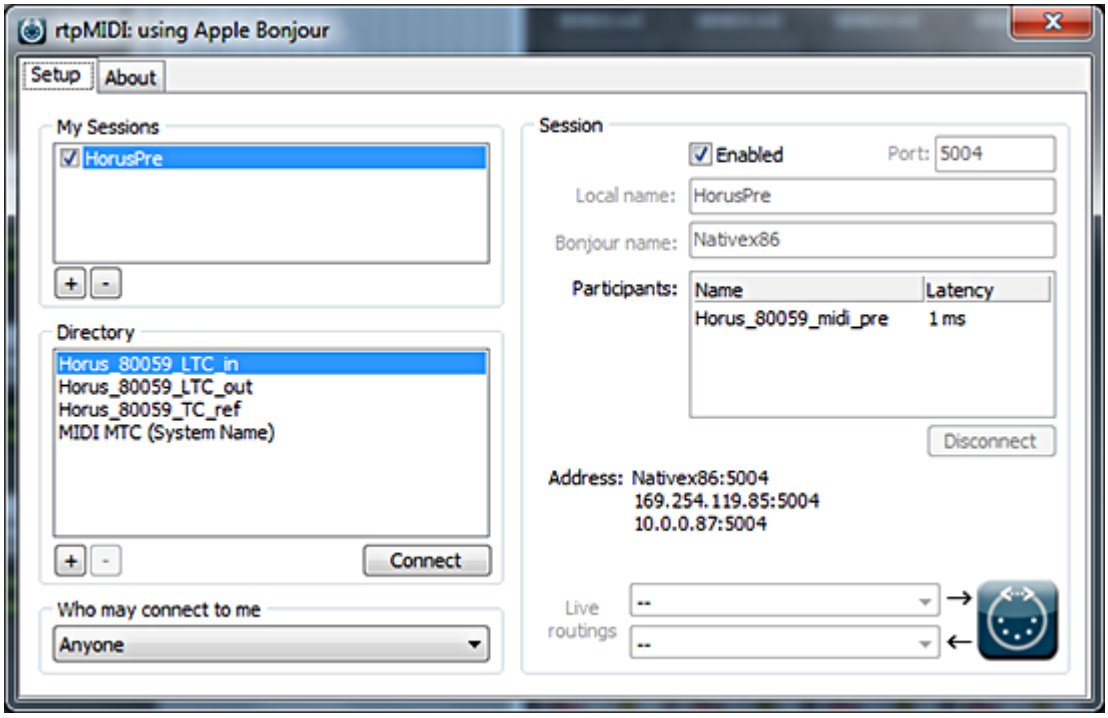
Pro Tools on PC

Horus analog preamps can be controlled directly from within Avid Pro Tools running on a PC.
In order to set Pro Tools up for Horus preamp control follow this procedure:

1. Check the Horus firmware version and update if necessary to **v19734** or above.
2. Connect Horus to the system running Pro Tools through the Ethernet. port.
3. Download **rptMIDI** from here:

   http://www.tobias-erichsen.de/wp-content/uploads/2012/08/rtpMIDI_1_0_11_227.zip

4. Install **rptMIDI**
5. Start **rptMIDI**



rptMIDI control panel

6. In the **My Sessions** section (top left) click on the + button to add a new entry.
7. In the **Session** section (right) rename the entry in the **Local name:** field to **HorusPre**.
8. In the **Directory** section (bottom left) select the **Horus_80xxx_midi_pre** module entry to add it to the **Participants** list.
9. At the top of the **Session** section check the **Enabled** box to enable the session.
10. Close the **rptMIDI** control panel.
11. Open the **MTDiscovery** application and check that the Horus is connected.
12. **Please see: Within Pro Tools: on page 24** and follow step 10 and complete the subsequent steps in Pro Tools followed by restarting Pro Tools.

6 Pyramix

DSD & DXD Capabilities

When Pyramix Native uses the **Ravenna ASIO Driver** e.g. when used in a laptop recording scenario the following capabilities are available:

Merging RAVENNA ASIO Driver - DXD/DSD Specifications (Requires Pyramix & the RAVENNA ASIO driver v8.1 and above, plus the latest Horus firmware)								
	Project DXD		*Project DSD64*		*Project DSD128*		*Project DSD256*	
MEDIA (single media)	*Playback* & Outputs*	*Record*	*Playback* & Outputs*	*Record*	*Playback* & Outputs*	*Record*	*Playback* & Outputs*	*Record*
DXD	48 Tracks 8 Outputs	8 inputs	NA	NA	NA	NA	NA	NA
DSD64	48 Tracks 8 Outputs	NA	48 Tracks 8 Outputs	8 inputs	NA	NA	NA	NA
DSD128	48 Tracks 8 Outputs	NA	NA	NA	48 Tracks 8 Outputs	8 inputs	NA	NA
DSD256	48 Tracks 8 Outputs	NA	NA	NA	NA	NA	48 Tracks 8 Outputs	8 inputs
* Projects have no tracks limitation, the specified playback track value is based on the tracks containing media.								
Note: The performance will depend on the System and Disk configuration especially when it comes to notebooks								

7 General Troubleshooting

Ravenna: Horus & Network configuration

1. First check the IP address of the Horus device in **Setup page > Advanced > Network**
   To be able to see each other, the Ethernet port and the Horus must be in the same range of addresses. (for example 192.168.xxx.xx).
2. The Horus IP address can be set and checked in the Horus **Setup page > Advanced > Network**.

Note: Some laptops require an Ethernet card driver update (2012) in order to work with Horus/Ravenna in certain address ranges.

Working With Multiple Horus' Over a Network

Please refer to the Ravenna Network Guide (for Merging Technologies Products) for all details about configuration and setup.

Ravenna Connections:

If you cannot connect devices in Ravenna Easy Connect make sure that you have the latest Horus Firmware and the latest ASIO or Core Audio driver.

Latency and Buffers

Small buffers have the advantage of low latency in the record monitor path, but also are more taxing on the computer's CPU and could contribute to audio dropouts in during record or playback.

Larger buffers have the advantage of making the CoreAudio Driver more immune to audio dropouts during playback and recording but can cause a noticeable delay when monitoring inputs during recording. In some CoreAudio-client applications, performing various tasks will interrupt the CoreAudio Driver and may result in clicks and pops in audio playback or recording. Choosing a different buffer size can help alleviate this problem.

8 MT Discovery

Overview

MT Discovery is a standalone application that searches your network(s) for Bonjour Services. It enables quick and easy access to Merging Technologies Web Services based on Bonjour, such as the Horus configuration page. These pages will be open in your computer's default browser. MT Discovery can be used to update the Horus Firmware. Please refer to the Horus User Manual for detailed information about this procedure.

> **Note:** The default web browser is determined by a computer setting, not from MT Discovery. It will most probably be one of the following applications:

- Microsoft Internet Explorer
- Apple Safari
- Mozilla Firefox
- Google Chrome.

Google Chrome or Apple Safari are recommended for use with Merging Technologies products.

Using MT Discovery

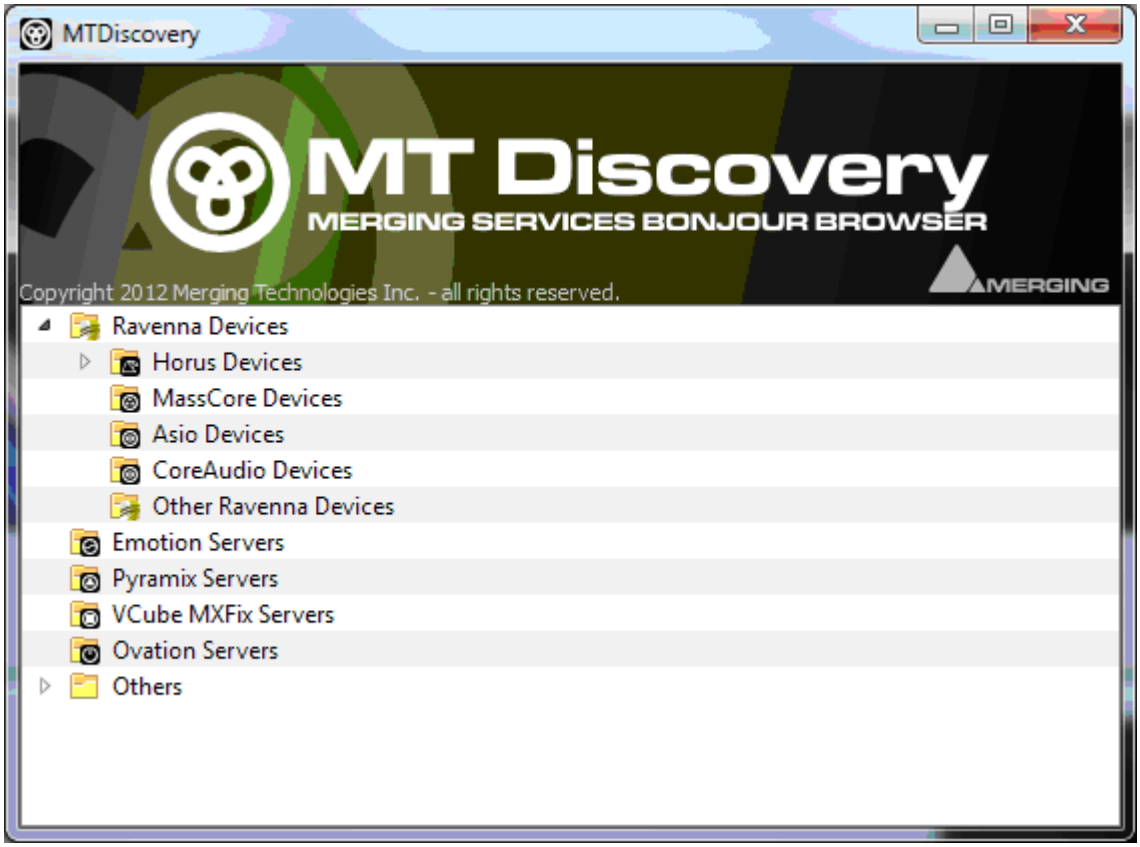
Note: The information in this chapter refers to Windows. Mac implementation is similar.

Launch MTDiscovery

Launch the MT Discovery application from the Windows Start Menu:

All Programs > Merging Technologies > MT Discovery

or by clicking on the desktop icon.



MT Discovery Window

The MT Discovery application window displays a tree view of all the devices it finds on the Bonjour Network. It refreshes automatically when a device is connected or disconnected.

Groups

MT Discovery will sort all devices into groups automatically (displayed like folders), depending on the characteristics of the devices.

The different groups are:

- **Ravenna Devices**

This group contains devices which have the Ravenna protocol enabled and sorts them into different subgroups:

- **Horus Devices**
- **MassCore Devices**
- **Asio/Core Audio Devices**
- **Other Ravenna Devices**.

- **Emotion Servers**
- **Pyramix Servers**
- **VCube MXFix Servers**
- **Ovation Servers**
- **Others**

The **Others** group contains all Bonjour devices that could not be identified by MT Discovery. Printers are likely to be found in here.

> **Note:** The number in brackets near a collapsed folder indicates how many devices this folder contains.

Actions

Right-clicking (**Ctrl+click** on Mac) on an item on the tree view displays a contextual menu, which lists the actions available for the item.

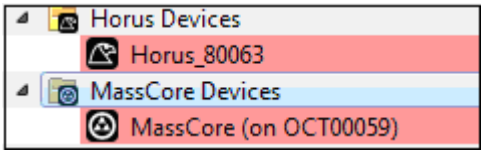
Open	Open is what you will want to do most of the time. It will show the main page of the device in your computer's default web browser. This can also be achieved by double-clicking on a device, or by hitting **Enter** when the device is selected.
Open Advanced	Open Advanced will attempt to display the main settings page of the device in the computer's default web browser. This can also be achieved by holding down **Ctrl** (**Cmd** on Mac) and double-clicking on a device, or by hitting **Ctrl + Enter** (**Cmd + Enter** on Mac) when the device is selected.

> **Note:** Some devices will not support this, and your web browser will report a **404 - page not found** error. In this case, we recommend you access the main page with command **Open**, described above, then browse to the setup page in your web browser directly.

Expand / Collapse	Only available for Groups, shows/hides the contents of a folder in the tree view. This can also be achieved by clicking on the **+/-** sign on the left side, or by double-clicking on the Group name.

Color Coding

The color of Ravenna Device entries indicates the network they are on. Same color = same network.



Device Network Color Coding

> **Note:** Horus and MassCore entries must be the same color in order to work together in Ravenna mode.

Additional Information

The MT Discovery application is located in the following folder:

On Windows	**C:\Program Files\Merging Technologies\MTDiscovery**
On Mac	**TBA**
On Linux	**TBA**

9 Merging Ravenna Easy Connect

Overview

The **Ravenna Easy Connect** utility is installed along Pyramix v8 and included in the ASIO and Core Audio Drivers package. This utility enables Horus users to connect the visible Ravenna streams and route them accordingly to the desired I/Os.

Note: The information in this chapter refers to Windows. Mac implementation is similar.

Accessing Easy Connect

When Pyramix is launched with the VS3 Control Panel set to Ravenna mode the Ravenna Easy Connect utility is launched automatically and appears in the Windows system tray. Users who have installed the ASIO and Core Audio Drivers will also have the utility running in the respective tray.

Easy Connect Tray icon

Pyramix

The Ravenna Easy Connect dialog is opened by:

View > Windows / Tools > Ravenna Easy Connect

It can also can be opened by clicking on the Pyramix toolbar icon:

Pyramix Toolbar icon

Once the dialog is open the connection tree is displayed.

Easy Connect will see all the Ravenna connections which are activated in the Horus module pages (as Ravenna).

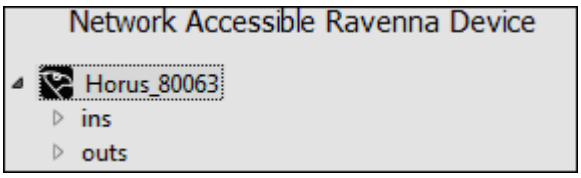
Local Computer Ravenna Host

The left-hand column of the Easy Connect window shows the connections used on your MassCore system, ASIO or Core Audio host.

Easy Connect Local Ravenna Hosts

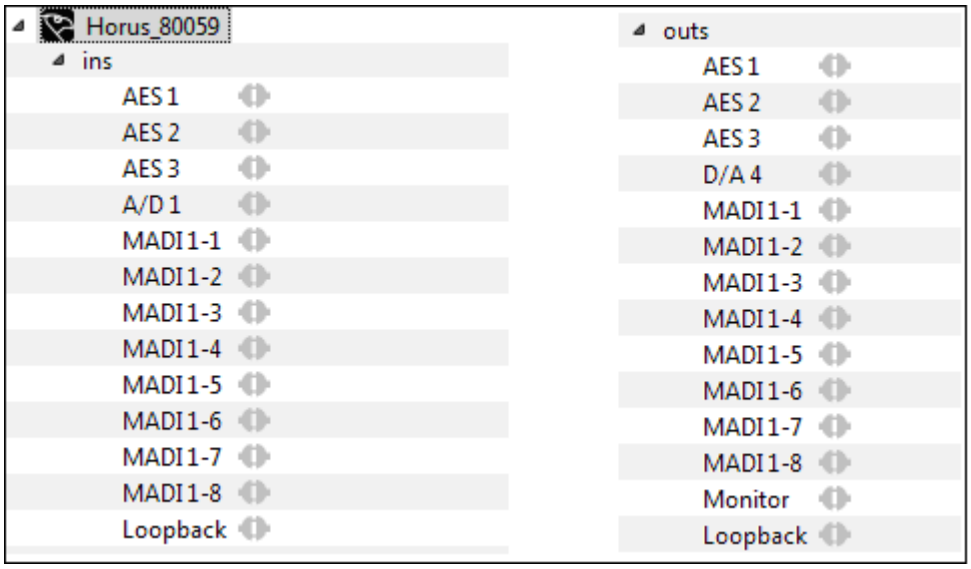
Network Accessible Ravenna Device

The top right-hand entry in the Easy Connect window shows the available Horus units.



Easy Connect Network Ravenna Device

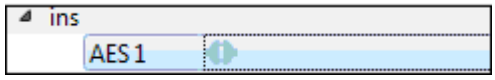
Expanding the Horus entry displays the **ins** (inputs) and **outs** (Outputs) available. These can be connected or disconnected (from drop down menu). If a Module Output Source is not set to Ravenna it will not appear in the Easy-Connect Inputs and Outputs list.



Easy Connect ins and outs

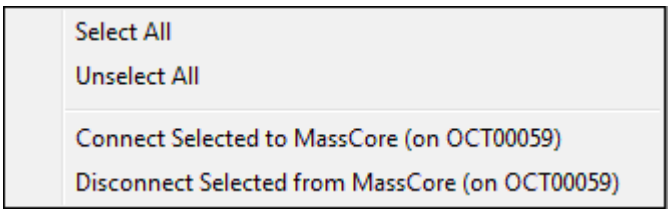
Making a connection

Click on the module to be connected. It will be highlighted once clicked.



Easy Connect Selected I/O Module

Right-click to access the drop-down context menu. Here you can connect or disconnect the module I/O.



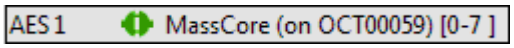
Easy Connect Context Menu

Alternatively use the buttons in the lower part of the Easy Connect window to perform the connection or disconnection

Easy Connect Connect & Disconnect buttons

Double-clicking on a Ravenna module entry will Connect or Disconnect the module.

Once the module connection is made a Green icon will be displayed



Easy Connect Module Connection

Connection Status

Not connected

Connected correctly

Connection Error (see message displayed at bottom of Easy Connect window for details)

Partial connection

A **Partial connection** indicates that the connection to the MassCore, ASIO or Core Audio host cannot be made. Please verify that the MassCore, ASIO or Core Audio host is available in the left-hand Easy Connect column. If it is present select the problematic input or output and disconnect it, then reconnect it.

If the MassCore, ASIO or Core Audio host is not present please exit and restart the application.

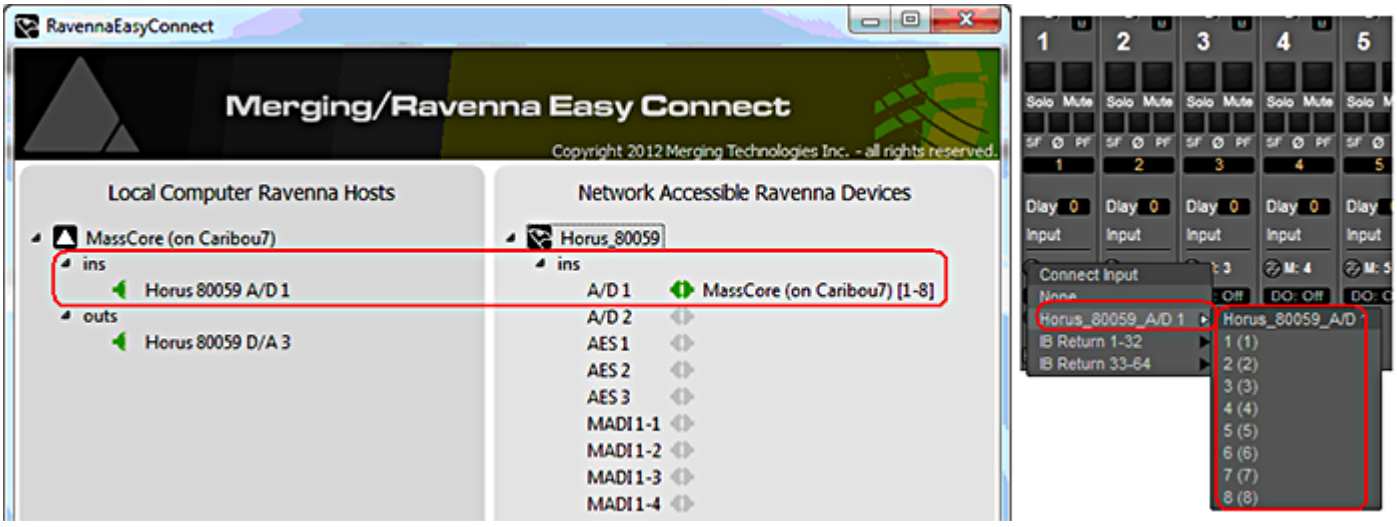
> **Note:** Each Input and Output module is in blocks of 8 channels (except for Monitoring which is 2 channels)

Once connected the Inputs or Outputs will be available within the Pyramix Mixer for I/O connections.

Activated Connection Example

Once a Ravenna connection has been enabled it will be made available in the Pyramix Mixer.

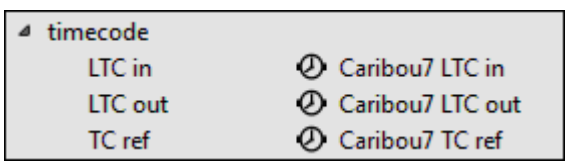
In the example below the AD1 input has been enabled:



Easy Connect & Pyramix Connections

TimeCode Connections

Horus TimeCode Ravenna connections can also be enabled from Ravenna Easy Connect :

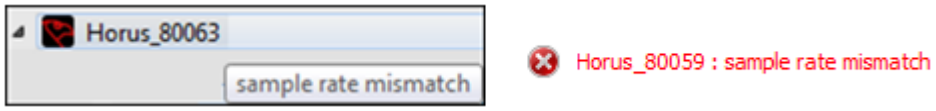


Easy Connect TimeCode Connections

Additional Details

A warning red sign on the Horus logo along with a pop message will warn the user that the Horus and Pyramix project are not at the same sampling rate.

Configuration error: Roll the mouse over the Horus red warning to display the exact error:



Easy Connect Sampling Rate Warning

Or look at the bottom of the dialog.

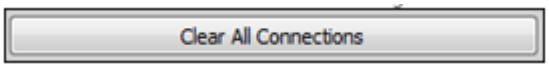
> **Note:** Horus and Pyramix sampling rates MUST match in order to enable I/O connections through Ravenna Easy Connect.

Clear All Connections

All current connections can be cleared by right-clicking on the Ravenna Easy Connect icon in the Tray to access the context menu and selecting **Clear Connections**.

Easy Connect Tray Icon Context Menu

You can also clear all connections using the button at the bottom of the Easy Connect Window:



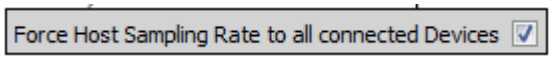
Easy Connect Clear All COnnections button

This will delete all the local Ravenna connections made previously for all inputs and outputs. A confirmation pop-up window will appear. Click on **OK** to clear the connections or **Cancel** to abort.

Ctrl + Click on the **Clear All Connections** button will force a delete of **ALL** existing Ravenna connections**.** Please be aware that this will clear connections that could be in use by other Ravenna hosts. Ensure that you know what you are doing.

Lock to Pyramix Sampling Rate

Ravenna Easy Connect also includes an option to lock the Horus to the Pyramix sampling rate.



Easy Connect Sampling Rate Lock Check-

When active the MassCore system will always ensure that the Horus connected to it follows its sampling rate setting.

> **Note:** When running with Ravenna ASIO and Core Audio drivers the "Locked sampling rate" option is inactive, since Horus is the sampling rate master in such a configuration

Always on top

An option to display The Ravenna Easy Connect window can be set to **Always On Top** in top from right-click context menu.

Easy Connect Always On Top message

Working with multiple Horus over a network

If you have multiple Horus's in your environment they must all be connected to a Merging certified switch. Please refer to the Ravenna Network Guide (For Merging Technologies Products)

Each Horus will then appear in your Ravenna Easy Connect utility where you will see the name of each Horus online. You will be able to make each Horus' I/O connections with the Ravenna Easy Connect utility.

Troubleshooting

Sudden stoppage of Ravenna Easy Connect

If the Ravenna Easy Connect utility crashes or stops simply launch it again from the Windows Start menu under:

All Programs > Merging Technologies > Ravenna Easy Connect > RavennaEasyConnect

10 Contacting Merging

International Office:

Merging Technologies S.A.
Le Verney 4
CH-1070 Puidoux
Switzerland
Phone: **+41 21 946 0444**
Fax: **+41 21 946 0445**

UK:

Merging UK
St Clare House, St Clare Business Park
Holly Road, Hampton Hill
Middx UK
TW12 1QQ
Phone: **+44 (0) 20 894 16547**
Fax: **+44 (0) 870 1231747**

USA:

Merging USA (Independent Audio)
43 Deerfield Road
Portland,
ME 04101-1805
United States of America
Phone: **+1 (207) 773 2424**
Fax: **+1 (207) 773 2422**

For all documentation inquiries or suggestions for improvement:
http://www.merging.com

Index

A

ASIO
- Bundled Applications and Documentation 13
- Latencies 14
- Latency and clicks 14
- Ravenna ASIO Panel 14

ASIO Driver 9

C

Contacting Merging 38
Core Audio 17
- Bundled Applications and Documentation 21

Core Audio Settings Panel 20

E

Easy Connect 32
- Accessing 32
- Activated Connection Example 35
- Additional Details 36
- Always on top 37
- Connection Status 35
- Local Computer Ravenna Host 33
- Lock to Pyramix Sampling Rate 36
- Making a connection 33
- multiple Horus 37
- Network Accessible Ravenna Device 33
- TimeCode Connections 35
- Troubleshooting 37

H

Horus Preamp Remote Control 23

I

Infrastructure 8
Installing the Ravenna ASIO Driver 10
Installing the Ravenna Core Audio Driver 18
Introduction 5
Introduction to Ravenna Technology 6

L

Latencies 14

M

Mac
- Buffer Size Recommendations 22
- Ravenna Core Audio Panel 22
- Security Firewall 22

Merging Ravenna Easy Connect 32
MT Discovery 29
- Actions 31
- Additional Information 31
- Color Coding 31
- Groups 30
- Overview 29
- Using 30

Multicast 8

P

PC Operating Systems (OS) 9
Preamp Remote Control 23
Pro Tools on Mac 23
Pro Tools on PC 26
Pyramix DSD & DXD Capabilities 27

Q

Quality of Service 8

R

Ravenna Core Audio Driver (Mac) 17
Ravenna Technology 6

S

Streaming 8

T

TimeCode Connections 35
Troubleshooting
- ASIO 14
- General 28

Troubleshooting Core Audio 22

U

Unicast 8

MERGING